

the experimental value of the last three or four figures? The specific gravity of each species relative to water is given as usual, so that the reference to hydrogen is only an additional torment for the learner. We doubt too the wisdom of explaining specific and atomic heats, and giving lists of their values. Isomorphism and pseudomorphism are hopelessly confused and interchanged on p. 20, while the illustrative formula is quite unintelligible. The adjusting apparatus of the ungraduated goniometer is, as usual in text-books, wrongly disposed for use. We have noticed several mistakes of fact and errors of printing; but the book is neat in style, and perhaps will not do much harm.

The Prospector's Handbook. By J. W. Anderson, M.A., F.R.G.S. 8vo, pp. 132. (London: Crosby Lockwood and Co., 1886.)

THE author, after traversing the mineral fields of New Zealand, New Caledonia, New Mexico, and Colorado, feels convinced that some simple guide or handbook for the use of prospectors as well as travellers is a desideratum, and the present volume is the outcome of this conviction. It contains a number of notes or paragraphs upon subjects incidental to metallic mining, which are distributed into chapters under the different heads of prospecting, rocks, blowpipe-testing, character of minerals, metals, and metallic ores, other useful minerals and ores, composition of various rocks, testing by the wet process, assay of ores, and surveying; to which are added an appendix of tables and a glossary of terms. As the whole text is contained in rather more than a hundred pages, not very closely printed, it will be easily understood that no one of the numerous subjects included in the author's programme is very thoroughly treated. The best part of the book is the introductory chapter on prospecting, which contains some useful generalisations on mineral deposits and the search for them, which, however, are more likely to be of use to the "tender-foot" than to the prospector properly so called. It would seem, however, that this is what the author has in contemplation, as, from some remarks on p. 9, he appears to consider prospectors and miners as two different classes of men, and evidently has no very favourable opinion of the latter. Our own experience points in the opposite direction and leads us to regard typical prospectors as representing the highest and most intelligent class of operative miners. Unfortunately it is difficult to keep them on regular mining works except during the winter time, when the mountain regions are inaccessible.

The remainder of the book is of very little value. The descriptions of minerals are short, without being clear, and in many cases far from accurate. Thus, the composition of galena is stated to be "80 per cent. of lead, the rest sulphur"; malachite is said to contain 70 per cent. of copper, and silicate of zinc about 67 per cent. of zinc. All of these statements are incorrect, and it is not easy to see why they have been made, as no more space would have been required to give the composition corresponding to the theoretical constitution.

The sections on assaying and analysis are not likely to be required by the prospector in the field, and are too vague to be of much use to sedentary students. A description of the methods adopted in sampling gold and silver-bearing vein-stuff in the Western States and Territories of America would have been of interest, but we find no notice of this or any analogous practice followed elsewhere.

The glossary at the end contains several curious definitions, many of which, however, are reproduced from previously published works. The description of the term "tribute" more properly applies to dues or royalty rents as understood in this country. It may be that the author's definition applies to some local foreign usage, but this is not stated.

H. B.

LETTERS TO THE EDITOR

[The Editor does not hold himself responsible for opinions expressed by his correspondents. Neither can he undertake to return, or to correspond with the writers of, rejected manuscripts. No notice is taken of anonymous communications.]

[The Editor urgently requests correspondents to keep their letters as short as possible. The pressure on his space is so great that it is impossible otherwise to insure the appearance even of communications containing interesting and novel facts.]

Hereditary Stature

PERMIT me to correct one word in my memoir on "Hereditary Stature" in the last number of NATURE (p. 297, col. 1, line 6 from bottom), which should read "seven" on an average. I should be glad at the same time to amplify the passage in which it occurs, as follows:—

The chance that the stature of the son will at least rival the stature of the father, is not uniform; it varies with the height of the father. When he is of mediocre stature, that is, 5 feet 8½ inches, out of every 100 sons born to a group of fathers of that height, 50 will be taller and 50 will be shorter than their fathers (the practically impossible case of absolute equality being neglected). Here then the chance of which we are speaking = 50 per cent. When the father is tall, the chance in question diminishes; when he is very tall, say 6 feet 5 inches, the chance is reduced to seven per thousand. The following table shows the probabilities in various cases. Columns A contain the height of the fathers, Columns B show how many per cent. of the sons will rival or surpass the height of their fathers:—

A	B	A	B	A	B
ft. in.	per cent.	ft. in.	per cent.	ft. in.	per cent.
5 8½	50	6 0	15	6 4	1·4
5 9	42	6 1	9	6 5	0·7
5 10	31	6 2	5	6 6	0·3
5 11	22	6 3	3		

FRANCIS GALTON

Deposits of the Nile Delta

TWO communications from Sir William Dawson, published in NATURE of January 7 and 28 (pp. 221, 298), appear to call for a short notice from me. The report on the above subject which I read before the Royal Society on November 19, 1885, and of which an abstract appeared in NATURE of December 10, ought not to be referred to as "the report of the Delta Committee of the Royal Society." The origin of this report was as follows:—As there was no other geological laboratory available for the examination of the samples of delta-deposits sent home by Col. Maitland than the one connected with the Normal School of Science and Royal School of Mines, the other members of the Delta Committee requested me to undertake the microscopical and chemical investigation of the specimens. In preparing my report on them I was struck by the remarkable and unexpected characters which they presented, and I ventured to suggest a mode of accounting for them. When my report was submitted to the Committee I was requested to lay it before the Society; and, it would seem quite superfluous to add, neither the Committee nor the Society thereby accepted any responsibility for the views which I expressed in the report.

As Sir William Dawson lies under a manifest disadvantage in attempting to criticise a report which he has not seen, it will not be necessary to enter at length upon the subject of his communications. If I understand the first of these aright, he takes the opportunity in it of withdrawing his untenable assertion that "at a depth of 30 or 40 feet the alluvial mud rests on desert sand" in favour of the *totally different* statement that "the modern Nile mud" lies on "a Pleistocene or Isthmian deposit." In the absence of any palaeontological evidence I can offer no opinion as to the truth of this latter view; but it is certain that the deposits above and below the limit mentioned are of precisely similar mineral characters. With respect to the second communication, I need only add that when its author has the opportunity of reading the report in question, he will find that the very obvious considerations to which he refers have been by no means lost sight of.

JOHN W. JUDD

Stone Implements and Changes of Level in the Nile Basin

I INCLOSE a letter from my brother at Wady Halfa. The scrapers sent home are all made out of flat oval pebbles of

jasper, one side of which is left untouched, while the other is all chipped away except a small central area; most of them are unfinished. The few implements found among the quartz chips are very rough, and may be classed as lance-heads. The smaller pebbles of agate and carnelian seem to have been broken up in great numbers to obtain, out of the interior flakes, small articles about the length of the thumb-nail, of two types, pointed and rounded.

There is one doubly-pointed arrow head of jasper carefully finished like Fig. 299 in Evans's "Stone Implements." Also several rough implements of larger size of impure basalt. Many of the hammer-stones are very characteristic, and have been much used. Others show the effect of attrition by sand, &c., as in those from the Irish sand-hills.

F. ARCHER

Crosby, Liverpool, January 30

Wady Halfa, January 2, 1886

SIR,—When serving in the Soudan last winter, in the occasional walks I was able to take in the Desert I kept a look out for stone implements, but failed to find any until I reached Abri, where I picked up on the beach a well-worked flake, but much worn, of Egyptian jasper.

Shortly after my arrival here I found several scrapers in the plain lying between the river and the hills, and more extended search led me to further discoveries. The hills at Wady Halfa, which are of sandstone capped with trap (?), are distant about a mile and a half from the present banks of the river, but at a bend of the Nile about eight miles below our camp the valley narrows, and the cliffs rise almost perpendicularly from the water's edge. To the south it widens to the extent of some six or eight miles between the hills on either bank. The whole of the plain between the sandstone ridges is covered with a deposit of Nile mud of unknown depth, but on the right bank this is to a great extent concealed by the sand and pebbles brought down in past ages by the river. The ground is uneven, here and there rising to mounds of hardened mud. There is, however, a gradual though slight rise towards the hills. Soon after my arrival I picked up a number of flakes of quartz, and found that they were most numerous in a belt of dried mud about half a mile distant from the river and a quarter of a mile in width, and tracing this northward I found a mound, some acres in extent, formed of mud and completely covered with sand and tons of chips of quartz, and also of agate, onyx, carnelian, and other hard stones. It was evidently the site of an ancient manufactory, and on this spot, in the many visits I have since paid to it, I have got numerous more or less well-fashioned specimens. Stone hammers may be picked up by the dozen, and these are made of many different minerals. The most interesting are those formed of silicified wood, of which large blocks, curiously polished by the action of the water and sand, are still lying on the river's bank. Tracing the belt further, I have found, both north and south of the camp for many miles, chips and hammers more or less abundant, and little water-worn. I have reason to think that the same is the case on the left bank.

Rambles in the desert, and search among the debris brought down by the Nile in former times were rewarded by the discovery of many roughly-worked flakes, evidently of much earlier date, being very much water-worn. These were widely scattered over the desert, being nowhere abundant. The highest point at which I found them was on the summit of a gravel-covered mound about 50 feet above the present level of the river.

A proof of the Nile having in former times flowed at a much higher level than it does at present, is found in the fact that valves of the peculiar Nile bivalve, *Atheria*, may still be seen attached to the rock close to the foot of the hills, and at an elevation of some 30 feet above the present bank. As this shell must necessarily have lived always under water, the rocks when they are found must formerly have been part of the river-bed. If then as now the difference in height between high and low Nile amounted to 40 feet, it is evident that when the shells were living the stream flowed 60 to 70 feet higher than it now does. Whether the stream has receded or the land been elevated I am unable to decide.

It is stated in Murray's Handbook—I know not on what authority—that there is an inscription at Sannek, 35 miles south of Wady Halfa, which records that in the reign of Amenahat III. of the twelfth dynasty, the Nile at that place rose to a point 27 feet 3 inches higher than it does at the present time. If this is the case and if the same were true as regards the river at this place, the implements and chips found in the belt previously

mentioned are of a date subsequent to the reign of that king. I have found some hammers and flakes in the plain not far from the Nile, and very little above its present level.

If any traveller is desirous of obtaining specimens from this neighbourhood he will find a landmark in the British Military Cemetery, from which point the strip of desert in which the remains are most abundant may be traced north or south. The mound of chips is about a mile to the north of the graveyard overlooking an ancient water-course.

S. ARCHER

P.S.—Since writing the above I have found another small mound with quartz flakes only between the Nile and the railway.

Parallel Roads in Norway

PARALLEL roads in Norway, such as those described by Mr. Hansen in your last number (p. 268), have already attracted the attention of several British geologists. Robert Chambers, a careful observer, saw and described them as long ago as 1849. His description, however (*Edinburgh Philosophical Journal*, vol. xlviii. p. 71), seems to be unknown abroad, and is not generally accessible anywhere. With your leave, therefore, I quote it entire.

"The valley of the Laugen, for several miles down, contains great masses of pure sand in the form of terraces and isolated mounds. On one of the latter Dovre Church is situated. . . . In this portion of the valley there is a terrace unlike the rest, in as far as it is a narrow ledge of detrital matter, running continuously along the hill-side for fully fourteen miles, however much more, while the terraces resting on the skirts of the hills lower down are great projecting masses, seldom extending far on one level. This remarkable terrace is most conspicuous on the south-west side of the valley. It begins on that side at Oue, between the Hougén and Tofte post-stations. It is there seen truncating the prominent ancient delta of a side stream, called, in Prof. Munch's map, the Jondals Elv, several hundred feet above the bottom of the valley. As we ascend the valley, it becomes nearer to our eye, but this is only because we rise to it, for, when examined with a correct instrument from its own elevation on the opposite side, it is proved to be for a great way truly horizontal. On the north-east side of the valley the corresponding mark is a line composed of slight projecting banks of water-laid sand. Though not continuous, this line is sufficient to have determined that of a long mountain-path connecting a series of farms. Beyond Lie post-station the road to Molde passes along it, and it here affords positions for a close series of hamlets, which make a conspicuous appearance in the map above cited. I believe it is nearly, if not exactly, of the same elevation with the little *hof*, called Dombaas, of which the height is given by Prof. Naumann as 2162 (English) feet. In its relation to the lakes in the summit between the two valleys (*i.e.* of Laugen and Rauma) it precisely resembles the lowest of the Inverness-shire *parallel roads*, as exemplified in Glen Spean, where advancing to the basin of Loch Laggan, between the Spean and Spey valleys. The terrace in every other respect bears a strong resemblance to the Inverness-shire *roads*, while in some important respects, as already noted, it differs from other terraces. I should much desire to see it obtain the attention of local observers, by whom its internal constitution and other features could be more particularly ascertained."

I offer this extract the more readily that the observations of the paper in which the passage occurs ("On Changes in the Relative Level of Sea and Land in Scandinavia") have scarcely received the attention, among Norwegian geologists, to which their care entitles them. Chambers further refers to the same terrace, in a descriptive and popular way, in his "Tracings in the North of Europe," a little volume reprinted (for distribution, fifty copies only) from *Chambers's Journal* in 1850. You will perhaps allow me to add this short reference to the other.

"In addition to the many sandy terraces at different and indeterminate heights, I discovered one of a much more remarkable character, passing along both sides of the valley for fully twenty miles, always at one elevation, and specifically identical as a terrace with the celebrated *roads* of Glenroy in Inverness-shire. It first became visible at a place called Oue (pronounced Ouya) on the west side of the valley, where it truncates the ancient delta of a side stream far up the mountain-side. It is seen thence passing along through the scraggy woods without any interruption, till, on our turning out of the valley, we lose sight of it among the high grounds near Lässö Lake.